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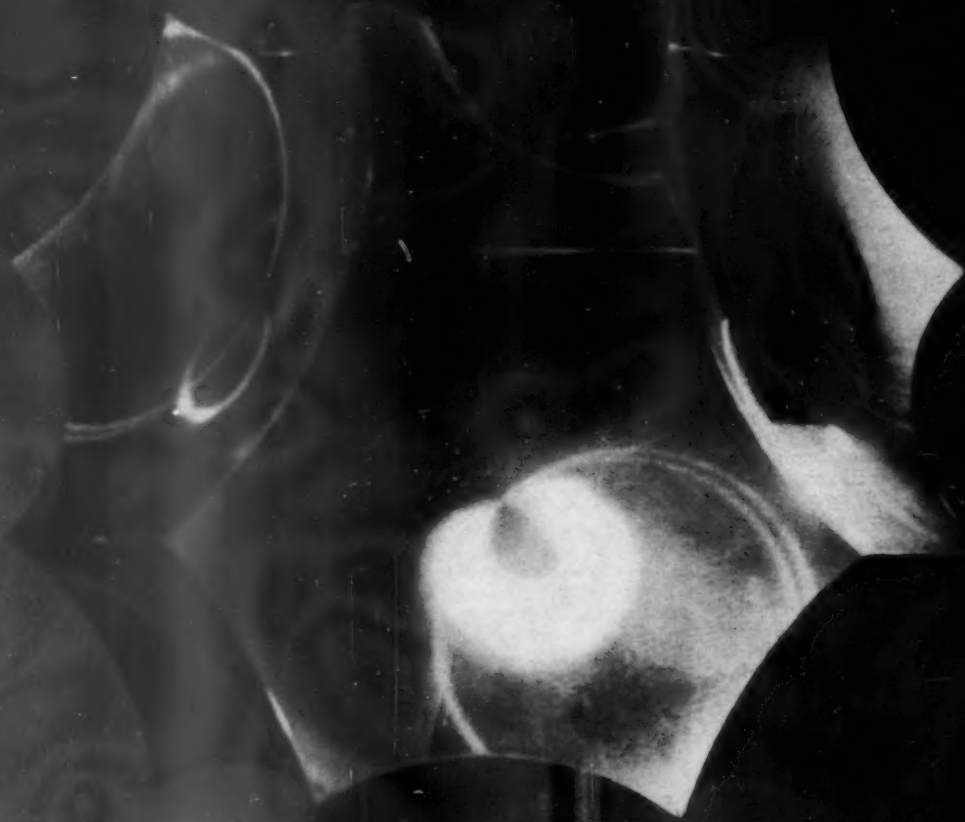
June 25, 1960

IND

VOLUME 10 NUMBER 25

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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A SCIENCE SERVICE PUBLICATION

ACOUSTICS

Foghorns Best Downwind

FOGHORNS are heard best when the ships they are warning are downwind, four scientists reported to the Acoustical Society of America meeting in Providence, R. I.

Their study of how sound carries over water when fog is present should help save lives and property at sea. Designers now have a scientific basis for planning fog signal stations so that the warning sounds can be heard over the longest possible distance.

The idea of using sound signals for finding one's position when lost in fog at sea is about as old as man's seafaring endeavors, the scientists said. Frequently, however, the warning sounds are heard too late to avert collisions or destruction on rocky shores.

The wind's roar and the sea's pounding make any sound difficult to hear under stormy foggy conditions. Now extensive tests of sound transmission over water off the Maine coast have shown that the range within which a given foghorn can be heard is much farther with the wind than against it.

Expressed more exactly, the scientists found that at a given distance upwind from a foghorn, the signal may be as much as 20 to 30 decibels weaker than at the same distance downwind.

They measured not only the hearing but also various conditions of the air through which the sound passed from the foghorn to receiving microphone aboard a laboratory vessel. The great difference observed between detection of sound upwind and downwind would require increasing a foghorn's power 100 to 1,000 times to make it heard the same distance upwind as downwind.

Since such an increase is not practical at this time, the scientists urge judicious planning of fog signal installations. By taking into account the direction of the prevailing wind during fog at a given station, the foghorn can be oriented so that the area of sea to be covered lies downwind, they concluded.

They also found that the presence of fog in the air above the sea does not in itself result in much loss of sound with distance. By measuring the size and number of water droplets in the foggy air, they confirmed this experimental finding using calculations from theory.

The scientists reporting their studies of sound in fog are Francis M. Wiener, J. H. Ball, C. M. Gogos and R. L. Hess of Bolt Beranek and Newman, Inc., Cambridge, Mass.

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Seen But Not Heard

RESTAURANTS from which automobile traffic can be seen but not heard are placed over the highway with a panoramic view of the Illinois Tollway in both directions.

How the sound and vibration problems involved in building such restaurants were

successfully solved was reported to the Acoustical Society of America meeting in Providence, R. I., by Howard C. Hardy of Howard C. Hardy and Associates, Chicago.

Mr. Hardy said the passing of vehicles tends to transmit vibrations through the ground to the columns supporting the restaurant. The impact of the air carried along by the vehicles also disturbs the structure.

The extent of these problems was determined by studying the responses of other bridges built over expressways.

The effects were reduced below noticeable levels by making the bridge-like construction stiffer than would be required if there were no restaurant. Also, Mr. Hardy said, the bridge support foundation was placed in sand. Pre-stressed concrete beams were used to help damp vibrations.

Traffic noise was isolated by placing a suspended partition under the structure to muffle sounds coming through the floor and by an unusual geometrical design for the ceiling. Two-foot squares of acoustical tile were suspended in the three-foot recesses of a specially form-poured concrete ceiling.

To give a more pleasant background than the intermittent noise from dish-handling, conversation and foot traffic, a small amount of background noise is deliberately generated in the ventilation system.

In the finished structures, Mr. Hardy said, the loudest vehicles are barely audible and there is no perceptible vibration.

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Teach Computer Vowels

ATTEMPTS TO TEACH an electronic "brain" how to tell one vowel sound from another are being made at Bell Telephone Laboratories, a scientist reported to the Acoustical Society of America meeting in Providence, R. I.

Dr. J. D. Foulkes said the work was part of a continuing effort to make machines that can hear, "understand" and act on spoken commands. Many of the sounds humans make when talking are classified as vowels. They are such sounds as "a" in date, "ee" in feet, "i" in mine, "o" in old, and "u" in cube.

Humans recognize these sounds correctly regardless of whether they are made by a child talking in a high voice or a man bellowing in a very deep voice. However, explaining the difference to a computer is difficult because no electronic "brain" has the mental abilities of even a small part of the human brain.

Dr. Foulkes said that scientists think the differences humans hear in vowel sounds are due to "resonances." If you blow in a bottle, you hear its "resonant frequency." By blowing in two bottles at the same time, you hear two "resonances," and their relationship gives the sound a distinguishable quality.

In music, such qualities are called major

and minor. They do not depend on the pitch of the notes.

Scientists believe relationships between resonances are responsible for the differing sounds of vowels, Dr. Foulkes reported. He said the Bell Labs were trying to classify these relationships in a way that a computer can handle.

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Oxygen in Sea from Dust

BILLIONS upon billions of tiny dust particles floating down to ocean surfaces every day may carry oxygen to fish living deep beneath the surface.

Tiny air bubbles found in ordinary drinking water yielded the clue that dust particles may be the way in which oxygen is introduced into ocean layers lacking oxygen-producing plants. William R. Turner of the Vitro Laboratories in Silver Spring, Md., reported his research on the microbubbles at the Acoustical Society of America meeting in Providence, R. I.

He suggested that his research may explain why the accepted theory covering the persistence of bubbles in water does not seem to hold true for bubbles smaller than 15 microns. Instead of rising to the surface or dissolving in 20 to 30 minutes, microbubbles sometimes remain in water for days.

Mr. Turner said his experimental evidence indicated that the dust particles raining down from the sky are wrapped in a coat of air molecules when they hit the water.

The water then slowly wets the dust particles and part of the air jacket is gradually removed. Finally the dust particle becomes too heavy to remain afloat and sinks, carrying the remainder of its air jacket with it.

As the dust sinks, the air jacket continues to break away in tiny chunks that become microbubbles.

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"Tone of Voice" Told

A PERSON'S "tone of voice" can be told even when he whispers.

Three scientists reported to the Acoustical Society of America meeting in Providence, R. I., that their experiments on communication by voice showed most persons could easily recognize happiness, surprise, boredom or disbelief in the voice of an unseen speaker.

The speakers, who had no dramatic training, would say such a neutral sentence as, "The lamp stood on the desk," and try, at the same time, to express various emotions.

Results showed that it is possible to identify a number of tones of voice quite accurately even when there is a considerable amount of interfering noise or when the speaker whispers.

The scientists testing verbal recognition of emotion were Drs. Irwin Pollack, Herbert Rubenstein, and Arnold Horowitz of the human factors office of the Air Force Cambridge Research Center, Bedford, Mass.

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MEDICINE

Tests Urged Before Shots

A standard method is urged to test for penicillin allergy. It will take at least five years to find out if special diets really can prevent heart attacks.

THE NEXT TIME your doctor decides you need penicillin, do not be surprised if he brings in an oxygen tank, a tourniquet and a bottle of epinephrine. He may even send you to a hospital.

Dr. Alexander A. Fisher of Woodside, Long Island, N. Y., reported to the American Medical Association meeting in Miami, Fla., that many doctors are urging that allergy tests be made before penicillin is given because so many persons are developing sensitivity to the drug.

In a poll of 50 general practitioners and allergy specialists in the New York area, Dr. Fisher found that some had stopped prescribing penicillin because it had brought on fatal anaphylaxis, a shock-like reaction in which the body tries to reject the foreign substance. Others were making tests before giving shots, but were unsure of just what technique and how much precaution to use.

Noting the confusion over how to test for this allergy, Dr. Fisher suggested a standard method, to be used before each and every penicillin injection.

For patients who have never had a reaction, a skin-scratch test should be given. The solution to be rubbed into the scratch should be from the same bottle as the injection dose, because specially prepared test solutions may deteriorate on the shelf and will not give a true result. A control scratch with normal saline rubbed in should be made at the same time.

If the patient is allergic, a positive reaction will show up in 15 minutes, usually in the form of a wheal (hives) at site of the scratch. If generalized itching, difficulty of breathing or general wheals appear, the tourniquet is applied and epinephrine is injected under the skin. If the scratch test is negative—one-tenth of the full dose is injected, and after a few minutes, the remainder is given.

For patients who may have had a previous reaction, the skin-scratch test is made with dilute penicillin. If it is negative, a second test is made by injecting a small amount not under, but into, the skin. This should be done only if equipment for shock treatment such as an oxygen mask, is available.

For patients who have had a reaction, tests should be made only in a hospital where full shock treatment, including facilities for making a substitute opening in the windpipe, is available.

An intravenous drip would be started before testing begins since, in cases of severe and rapid reaction, the time required to find a patient's vein and insert a needle for antishock treatment may be crucial. Such persons would be tested and given penicillin only if the illness was serious and when no other medication would do.

Dr. Fisher said the same tests should be made before giving penicillin pills, ointments or sprays. He emphasized the need for caution at every step of testing because severe or fatal reactions have occurred after negative skin tests.

He also noted that anaphylaxis can occur even if penicillin was well tolerated previously. "A negative skin test is valueless unless obtained immediately before each injection," he said.

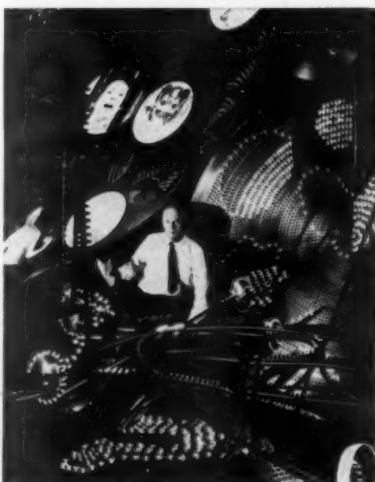
Science News Letter, June 25, 1960

Cholesterol Discussed

IT WILL TAKE at least five or ten years to find out whether diets aimed at lowering blood serum cholesterol really can prevent heart attacks, doctors at the annual meeting of the American Medical Association in Miami Beach, Fla., were told.

Dr. Grace A. Goldsmith, professor of medicine at the Tulane University School of Medicine, told colleagues the idea that dietary fat causes increased cholesterol levels, hardening of the arteries and coronary artery disease is no longer so simple as it appeared a few years ago.

"In our ignorance," she said, "many doctors believed that this relationship was true, but it has not been proven."



BRAIN MODEL—This functional brain model demonstrates how sensory stimuli—sight and sound—are used to create thought, in this case of a singer's voice. Developed for the Upjohn Company, Kalamazoo, Mich., the "brain" was shown at the American Medical Association meeting in Miami, Fla.

Cholesterol is only one of the serum lipids (fats) that might be related to artery-hardening in some way. No one knows just what the function of cholesterol or the other lipids is.

Some researchers believe the level of other substances, the triglycerides, is more important than that of cholesterol. One reason is that the concentration of triglycerides is higher in the serum of patients with coronary artery disease than in other persons.

Dr. Goldsmith also pointed out that the normal level of cholesterol and other serum lipids is not known. Nor does anyone know just how cholesterol is regulated and balanced in the human body.

No one has pinpointed the mechanism by which blood is cleared of cholesterol. Nor is there an answer to how diets with unsaturated fats—usually those that are liquid at room temperature—reduce cholesterol levels.

In addition to unraveling the already complex tangle of questions and answers, researchers must take on the task of substantiating or disproving a new theory.

This is that dietary fat affects blood coagulation and makes it easier for clots to form, thus increasing the chance of plugged-up blood vessels and heart attacks.

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Ulcer No Cause for Fear

STOMACH ULCERS are no cause for alarm, Dr. William H. Bachrach of Los Angeles told the annual meeting of the American Medical Association in Miami Beach, Fla. He said he is opposed to the philosophy that anybody with a gastric ulcer should be operated upon in order to be sure they do not have cancer.

The morbidity and mortality of operation for gastric ulcers exceed the risk that a benign looking ulcer will prove to be malignant, he said. Careful use of radiological data makes possible an accurate diagnosis of gastric ulcer in a high percentage of cases, and the application of a therapeutic test makes possible the diagnosis in almost all of the remaining cases.

"While there are many cases of gastric ulcer in which the radiological appearance is such that the criteria cannot be immediately applied, the probability of a benign ulcer is such that it is worth a further X-ray examination after a period of intensive medical management," he said.

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Fair Winners Honored

TWO NATIONAL Science Fair-International winners were among the hundreds of exhibitors at the annual meeting of the American Medical Association in Miami Beach, Fla. Brenda W. Lisle, 16, of Chattanooga, Tenn., and Philip C. Brockman, 18, of Grand Rapids, Mich., were honored as a result of their exhibits being chosen by a special AMA judging committee last month in Indianapolis. The AMA's interest in the National Science Fair is to enlist talented high school and college students in careers in medicine.

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SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Recerca e Disveloppamento.—Le trends del passate 15 annos permette le prediction que in 1962 le Status Unite va investir al minus 15 milliardos dollars in "recerca e disveloppamento." Le campos specialmente interessate va esser — probabilissimamente — illos del physica atomic, del chimia industrial e pharmaceutic, del electronica (incluse le vaste ramifications del problemas de communication), e del metallos rar. Al minus 60% del expensas va esser portate per le governmento federal, le resto per le industria private. In 1945, le summa total investite in "recerca e disveloppamento" in le Status Unite esseva minus que duo milliardos. Un trend de interesse major es le accentuation progressive del "recercas fundamental." in 1956, le summa total investite in recercas scientific in le Status Unite se divideva in 77 partes pro recercas applicate e 23 partes pro recercas fundamental. In 1960, iste proportion ha devenite 69 a 31.

Oceanologia.—Microparticulas de materia, precipitate ab le atmosfera ad le superficie del oceanos e descendente in lente sedimentation sin abandonar completamente lor micro-enveloppe de aere, es possibilmente responsabile pro le continue re-oxygenation del aqua marin a profundores ubi nulle altere provision de oxigeno pare possibile. Iste theoria esseva derivate per W. R. Turner, de Silver Spring (Maryland), ab su recercas in microbultas de gas in liquidos, i.e. bultas de diametros de minus que 15 microns. Un characteristic de tal bultas es que illos non ascende in aqua quite como plus grande bultas lo face. Le theoria del microparticulas explicarea iste comportamento non-orthodoxe.

Poliomyelitis.—Al Secunde Conferentia International Super Vaccinos de Virus Poliomyelitic Vive a Washington, un gruppo de specialistas russe reportava excellentes resultados obtenite in lor pais per medio del vaccino disveloppate per Dr. A. B. Sabin de Cincinnati (Ohio). In le Status Unite, le vive (attenuate) vaccino del Sabin es non ancora licentiate. In su loco on usa le vaccino morte de Salk, ben que—secundo le russos—illo es inefficace, costose, e difficile a producer in forma garantimentemente innocente. Le vaccino de Salk require injectiones. Illo de Sabin es administrate per via oral.

Pesos de Mesuras.—Le Camera del Representantes in le Congresso del Status Unite va tosto considerar un bill que instruera le Bureau National de Standards de studiar le desirabilitate e le practicabilitate de reimplaciar le systema de mesurationes nunc usate in iste pais per le systema metric.

Transporto.—Le compania Ford experimenta con un specie de ferrovia revolutionari que promitte attinger un velocitate de 700 a 800 km per hora. Illo functiona sin friction (e sin rotas) e in motion es levate supra le rails a un distantia de alcun millimetros.

Educacion Medical.—Statisticas financiari publicate per le Association American de Collegios Medical montras que le studente medical medie in le Status Unite expende \$2,911 per anno o \$11,642 in le curso del quatro annos que ille visita le collegio. Le familia del studente e le studente mesme paga 82 pro cento del total. Le remanente 18 pro cento es coperte per burasas e subventiones ab varie fontes. Le alte costo del education medical es responsabile pro le factor que 43 pro cento del studentes de medicina veni de familias con revenitos annual de \$10,000 o plus. Solamente 14 pro cento veni de familias con revenitos annual de minus que \$5,000. Iste cifras, compile pro le anno 1959, signala le urgente necessitate de un reforma "plus democratic" del education medical. Un

dettaglio interessante es que (in le anno 1959) 16 pro cento del studentes medical recipeva nulle supporto del toto ab lor familias e que 8 pro cento succedeva a ganiar plus que \$6,000 per anno in varie occupationes accessori, generalmente sin relation con le medicina.

Cosmospeculation.—Dr. F. J. Dyson de Princeton (New Jersey) regarda como possibile que avantissime creaturas intelligente in altere systemas solar ha solvite lor problemas de spatio e de energia per le construction de enorme spheras cave circum lor sol como centro. Le correspondente projecto pro nos terranos essera de utilizar le materia de Jupiter in le construction de un balla cave de un tenuissime spissitate de 3 a 4 m e un extensissime diametro de duo vices le diametro del orbita del terra. Le superficie interior de un tal balla potera supportar un humanitate fantasticamente numerosa, e iste humanitate habera a su disposition omne le energia del sol, con solmente le perdita de un micre quantitate de radiation de calor al exterior. Dr. Dyson non propone un tal projecto pro nos, sed ille nota que si de facto altere, plus avantie creaturas ha reconstruite lor systemas solar in iste maniera, nos pote discoprir lo solmente per deteger le supra-mentionate radiation de calor.

Statistica Medical.—In 1959, circa 3500 medicos moriva in le Status Unite. Le numero total del medicos cresceva nonobstante per circa 4800, proque le profession admittiva 8269 nove membros, incluse 1626 con trainamento e education foras del pais.

Astronautica.—Le cyclo del die de 24 horas, que determina le rhythmo de multes de nostre activitates e habitudes, va perder su fortia natural pro le astronauta del futuro. Dr. N. Kleitman del Universitate Chicago ha experimentate con altere cyclos e crede poter predicar que plus longe cyclos va resultar in plus alte grados de efficacia durante le horas de labor e in plus complete relaxation durante le horas de somnio.

Radiation Ionisante.—Le tri-lamine helice violette in un campos jalne, usate deposit plure annos per le statunitense Commission de Energia Atomic como symbolo signalante le presentia de radiation, ha essite adoptate con le mesme function per le Association American de Normas. Su uso es recommendate in signos identificante certe installationes e in etiquettas indicante le natura del contento de paccos e vehiculos.

Hypnose.—Le Academia American de Practica General condemna le abuso del hypnose pro objectivos de divertimento in general e in programmas de television in particular. Secundo le Academia, spectatores de television qui ha experientiate hypnotisation a distanta curre grave riscos que pote ben resultar in significative effectos psychopathologic.

Ornithologia.—Varie species de aves, incluse per exemplo le cardinal, es inconstrate in regiones progressivamente plus septentrional in le Status Unite. Un simile phenomeno es reportate ab Europa. Certe aves, traditionalmente regardate como mediterranea, ha essite observate usque a in le latitudine de Scandinavia.

Astronomia.—Le cintura de radiation circum le planeta Jupiter es multo plus intense (e periculose) que illo circum le terra. Le proportion es cento billiones (10¹⁰) a 1, secundo recercatores al Instituto Technologic de California.

Virologia.—Le crescentia de un certe typo de virus esseva promovite per le addition de aqua pesante (oxydo de deuterium) al medio de culturation.

GENERAL SCIENCE

Reading Interlingua

YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you had never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

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ASTRONOMY

May Test Universe Theories

AN ASTRONOMER has photographed the most distant, identifiable celestial object ever captured by photography. The object, believed to be a galaxy or a pair of galaxies in collision, is so far away its light takes six billion years to reach the earth.

The find will probably be used to test current theories about the nature and origin of the universe.

The object was photographed by Dr. Rudolph Minkowski, a staff member of the Mt. Wilson and Palomar Observatories, through the 200-inch Hale telescope at Mt. Palomar. The telescope is the world's largest optical instrument.

Dr. Minkowski announced his unprecedented observation at the Astronomical Society of the Pacific meeting in Eugene, Ore.

He not only photographed the object, he made two photographs of its spectrum. These photographs showed the spectrum had shifted much farther into the red than any obtained before. The normally invisible ultraviolet light appeared in the green.

The shift indicates that the object is receding from the earth at 46% the speed of light. This recession of 90,000 miles a second is the fastest ever measured by far.

Dr. Minkowski has been looking for an extremely distant object to help determine which of several theories about the universe is correct, if any is.

One major theory says that matter is being generated continually throughout the universe. The other, which has several variations, says the universe began with a great explosion and is continually expanding, its parts receding from the center.

The quest for the object now photographed began after radio astronomers in Cambridge, England, discovered and roughly located a source of radio signals in the constellation of Bootes. Dr. Minkowski was unable to locate the object until the source was located more precisely recently at Cambridge and at the California Institute of Technology Radio Observatory.

The photograph of the celestial object required a two-hour exposure. The object appears as a blurred dot on the photographic plate. But this blurred dot, if definitely established as the same object as that radio source recorded in England and California, may provide a major test of current theories of the origin and present state of the universe.

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TECHNOLOGY

"Serpents" Transport Oil

"SEA SERPENTS" are making regular commercial deliveries from a refinery at Fawley, near Southampton, England, to the Isle of Wight. They are also being used

extensively in Nigeria and in the Far East.

These "serpents" are huge nylon-fabric bags that float in the water for towing.

At the time of the Suez crisis, in the fall

of 1956, a group of scientists at Cambridge University, Cambridge, England, conceived the idea of using flexible containers, made from immensely tough proofed nylon fabric, as an alternative to oil tankers.

Since then, Dracones—from the Greek word for serpents—have rapidly developed, sponsored by the British Government's National Research Development Corporation, and now a company, Dracone Operations Ltd., has been formed to carry on worldwide commercial development of the idea.

They are proving economical craft for many jobs on coastal waters and inland waterways, and their possibilities are not confined to the transport of petroleum products; they are also being used to move solvents, liquid chemicals, edible oils, grain and rice.

The fabric from which they are made is immensely tough nylon, proofed on the outside with Neoprene and on the inside with oil-resistant acrylonitrile rubber.

Dracones, when empty, can be folded up and carried on a truck, railroad car or the deck of a ship. Or they can be wound onto pontoons and towed away.

The 100-foot version has a capacity of 35 tons but weighs only 2,576 pounds. Bigger ones, 200 feet long with a capacity of 320 tons, weigh about 13,500 pounds.

Present indications are that the life of a Dracone is upwards of five years even under rough working conditions. The initial cost is less than for steel barges and they are cheaper to operate. Very little maintenance is required. Very high standards for safety are achieved because there is no air space in which explosive vapors can build up.

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MEDICINE

Drug Lowers Cholesterol In Tissue and in Blood

TRIPARANOL (brand name MER/29) reduces cholesterol levels not only in the blood but in body tissues as well, research indicates. See SNL, June 4, 77; 355, 1960.

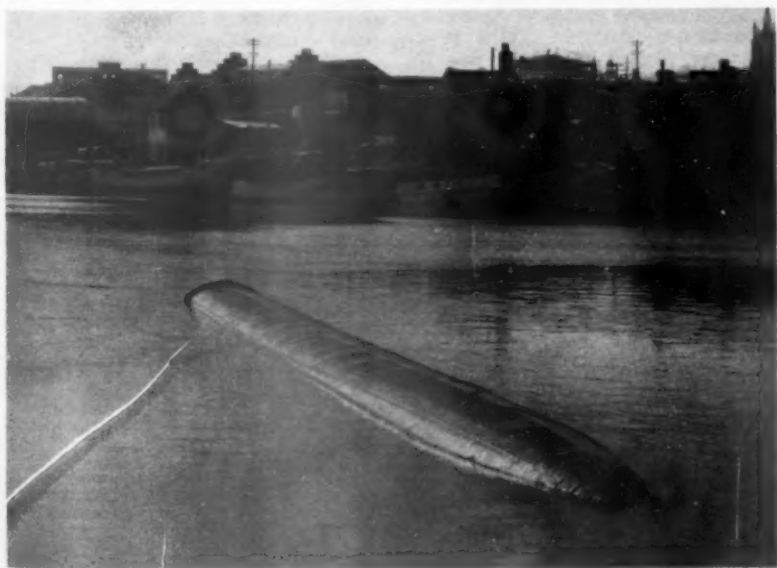
Dr. William Hollander of the Massachusetts Memorial Hospitals in Boston told the American Therapeutic Society in Miami Beach that by hooking radioactive tracers to cholesterol, he and Drs. Aaron Chabanian and Robert W. Wilkins found that triparanol reduced the level of total cholesterol in all body tissues and in the blood. Their subjects were 89 patients on an unrestricted diet, 43 of whom had evidence of coronary artery disease.

It was previously suspected that the drug reduced blood cholesterol levels merely by transferring cholesterol to the tissues. The doctors' research indicates that this is not the case.

In previous tests triparanol was shown to lower blood cholesterol and inhibit its production in the liver in about 80% of the persons tested.

Dr. Hollander said that if additional cholesterol is manufactured by arteries themselves, as other investigators have reported, he is willing to speculate that triparanol inhibits production at this site as well as in the liver.

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SEA SERPENT—A 100-foot dracone enters Newport Harbor, the Isle of Wight, England, with a load of kerosene.

SEISMOLOGY

Quake Prediction Foreseen

THE U. S. Coast and Geodetic Survey plans to furnish standard seismological equipment worth \$500,000 to 20 of their 25 seismological stations in the United States and 30 stations in foreign countries cooperating with the U. S. on earthquake information, a seismologist reported. The hoped result:

We may someday know ahead of time when and where destructive earthquakes will hit.

R. J. Brazee, chief of the seismological investigation section of the Survey, said that each unit of equipment will cost about \$10,000. The equipment for distribution in the U. S. will likely be given to stations already in existence although there is a possibility that new stations may be created.

The new standard equipment will be part of the epicenter location program—the epicenter is the focal point where an earthquake originates. The money has already been allotted for the equipment, Mr. Brazee said.

He said that the aim of this program will be to locate the epicenters of more earthquakes and get enough data on them to be able to predict when earthquakes will occur.

The equipment to foreign countries the world over will be for stations already in operation but in need of standard equipment as well as for possible new stations.

The equipment will be given to these countries without "strings attached," Mr. Brazee said. However, it is expected that these stations will cooperate, as many already do, with the U. S. seismological network.

Mr. Brazee said that the U. S. Coast and Geodetic Survey has 25 stations operating in the U. S. at present. In addition, this country has from 75 to 80 private seismological stations in operation.

These are mostly located in universities throughout the country. They cooperate in sending information on earthquakes to the Survey in Washington, D. C., the main center for this type of information in the U. S.

The sites in foreign countries to get the standard equipment have not yet been picked. Equipment will most likely go to the countries that have a good deal of earthquake activity or do a lot of seismological research. The standard equipment is used both for locating earthquake epicenters and for basic seismological research.

At the present, the U. S. gets information on earthquakes from about 300 co-operating stations all over the world, Mr. Brazee said. He added that there are some 600 stations in the world, all told.

He estimated that there are up to about 1,000,000 earthquakes a year the world over. Out of these the U. S. Coast and Geodetic Survey gets reports of about 40,000. From these 40,000, the epicenter of only 1,500 is actually pinpointed by the Survey.

The Survey at present has an IBM system by which it processes the data as received. When these data are fed into the ma-

chine it delivers the location of 40 epicenters in about two and a half hours. Mr. Brazee said that when better equipment is installed in stations all over the world, more exact information will be available. He estimated that the Survey will then be able to locate 4,000 to 5,000 earthquakes a year, compared to the 1,500 they can pinpoint today.

Science News Letter, June 25, 1960

DERMATOLOGY

Sunburn Can Make Vessels Abnormal

AFTER A SINGLE, moderately severe sunburn, blood vessels are abnormal for four to 15 months, Dr. William Becker Jr. of the University of Illinois has reported. Writing in GP magazine, June, 1960, published monthly by the American Academy of General Practice, he reports plain vanishing cream, containing 10% para-aminobenzoic acid, gives 30 times more protection than many commercial products.

Dr. Becker says sunlight does have beneficial effects, in spite of the dangers of over-exposure, which include skin aging and cancer. Sunlight produces vitamin D in the skin and causes an unexplained drop in blood pressure and serum cholesterol. But the skin color may become a yellowish or blotchy brown after prolonged exposure.

Science News Letter, June 25, 1960

PSYCHOLOGY

Inability to Stand Tension May Cause Addictions

ADDICTION TO DRUGS, alcohol or food may stem from inability to tolerate tensions, Drs. Alvin Rosen and I. Jay Oberman of the Philadelphia College of Osteopathy reported. They said the actions of an addict are directed toward the relief of

pain, frustration and tension. Writing in the Journal of the American Osteopathic Association, May, 1960, they said addiction is a response to the simple human desires to have pleasure, avoid pain, feel good and happy, and have peace of mind. In his attempts to fill these needs something "goes wrong" with the addict.

Science News Letter, June 25, 1960

ARCHAEOLOGY

Find Remains of City In Which No One Lived

REMAINS of a big ancient city in which no one ever lived was found by a party of scientists from the American Museum of Natural History in New York. The city extends for more than eight miles along the Porali River in western Pakistan.

The city, known to natives of the region as "City of Light," was not a ghost city in the sense that it had been abandoned. The only buildings in it were temples and other places of worship. It was really a twin site, the older of the two dating back as much as 4,000 years. Although no one lived in the city it was a sacred center visited by worshippers who traveled to it from places hundreds of miles away because no shrine like it has been found for hundreds of miles around.

Mud bricks of which the ancient buildings were constructed are no longer in place but stone foundations four to five feet tall and stone streets, floors, steps, ramps and wells are still in place. They are made of carefully fitted river boulders.

The newer of the twin cities is marked with puzzling circles some as large as 40 feet across and standing four feet high. One structure in the older city is 87 feet wide and 234 feet long. It has five entrances and seven rooms.

The expedition was under the direction of Dr. Walter A. Fairervis Jr. and the digging was done with the cooperation of Dr. F. A. Khan of the Pakistan department of archaeology.

Science News Letter, June 25, 1960



ANCIENT CITY—Aerial view of building remains from 2000 B.C. recently found in Pakistan.

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN CRYOGENIC ENGINEERING, Vol. 5—K. D. Timmerhaus, Ed.—Plenum Press, 584 p., illus., \$13.50. Proceedings of the 1959 Cryogenic Engineering Conference held at University of California. Covers applications and techniques, missile technology, insulation, heat transfer, liquefaction, and fluid phenomena.

AERO-THERMODYNAMICS AND FLOW IN TURBO-MACHINES—M. H. Vavra—Wiley, 609 p., illus., \$14.50. Offers a theoretical approach to turbomachine design.

ALGEBRAS AND THEIR ARITHMETICS—Leonard Eugene Dickson—Dover, 241 p., paper, \$1.35. Unabridged reprint of 1923 first edition.

CHILD IN THE SHADOWS: A Manual for Parents of Retarded Children—Edward L. French and J. Clifford Scott—Lippincott, 156 p., \$3.50. Guide to dealing with problems of mental retardation.

CLASSIFICATION OF HIGH POLYMERS: A Review—R. Houwink with H. Bouman—I.U.P.A.C. (Butterworths, Canada), 54 p., paper, \$2.25. Critical review of classification systems covering the field of plastics, rubbers and synthetic fibers.

COMSTOCKERY IN AMERICA: Patterns of Censorship and Control—Robert W. Haney—Beacon Press, 199 p., \$3.95. Discusses the evils of both official censorship and unofficial control of books.

COORDINATE GEOMETRY—Luther Pfahler Eisenhart—Dover, 298 p., paper, \$1.65. Unabridged reprint of 1939 first edition.

DICTIONARY OF AMERICAN SLANG—Compiled by Harold Wentworth and Stuart Berg Flexner, Eds.—Crowell, 669 p., \$7.50. Lists more than 20,000 definitions with derivations and dates of usage. Discusses also major sub-groups contributing to American slang, the mechanical formation of new words, changes in form and pronunciation and artificial slang.

A DOCTOR IN MANY LANDS: Autobiography—Aldo Castellani—Doubleday, 359 p., \$4.95. Story of the Italian surgeon and specialist in tropical diseases, among whose patients were kings, queens, dictators and celebrities.

EAST AFRICAN EXPLORERS—Intro. by Charles Richards and James Place, Eds.—Oxford Univ. Press, 356 p., map, \$2.75. Excerpts from the writings of explorers.

ELEMENTS OF PHYSICAL CHEMISTRY—Samuel Glasstone and David Lewis—Van Nostrand, 2nd ed., 758 p., illus., \$8.50. Thoroughly revised introductory text, with emphasis on clear presentation of basic principles of modern physical chemistry.

EVOLUTION: Process and Product—Edward O. Dodson—Reinhold, rev. ed., 352 p., illus., \$6.90. Textbook based on lecture course developed at the University of Notre Dame.

FATS AND OILS: An Outline of Their Chemistry and Technology—H. G. Kirschenbaum—Reinhold, 2nd ed., 240 p., illus., \$7. Includes latest information on the chemical structure, methods of processing and uses of both animal and vegetable oils and fats.

GLASS: Its Industrial Applications—Charles John Phillips—Reinhold, 252 p., illus., \$6.95. Covers the manufacture, physical and chemical properties, and applications of all types of glass.

IN THE LAND OF THE QUETZAL FEATHER—Friedrich Morton, transl. from German—Devine-Adair, 208 p., illus. by Fritz Berger, \$4.50. German explorer-naturalist's story of the struggle of survival of animals and man in the Guatemalan jungle.

INDIAN SCIENTIFIC & TECHNICAL PUBLICATIONS, EXHIBITION 1960: Bibliography—Compiled by The National Library, Calcutta—Council of Scientific & Industrial Research, New Delhi, 196 p., \$5.25. Guide to books and periodicals published in India. Part I contains entries in Indian languages; Part II, in English. Dewey Decimal Classification used throughout.

LET'S EXPLORE WITH THE ELECTRON—Alfred Bender—Sentinel Books, 128 p., 151 illus., \$1. Basic theory of electricity at elementary level, using household materials and inexpensive equipment for experiments.

THE LIST METHOD OF PSYCHOTHERAPY—Elizabeth Sher and others, introd. by Jacob S. List—Philosophical Lib., 259 p., \$7.50. Collection of papers on List's therapy of emotional reduction which stresses warm personal relationship between patient and therapist, and development of friendships between patients.

MORPHOLOGICAL ASPECTS OF PARASITISM IN THE DWARF MISTLETOES (Arceuthobium)—Job

Kuijt—Univ. of Calif. Press, 67 p., illus., 48 plates, paper, \$2.

THE MUTE STONES SPEAK: The Study of Archaeology in Italy—Paul MacKendrick—St. Martin's, 369 p., illus., \$7.50. Based on actual excavation reports. Classical scholar relates the story of the Etruscans, Romans, and Pompeians, for the general reader.

NINE PLANETS—Alan E. Nourse—Harper, 395 p., illus. by Mel Hunter, \$5.95. About the planets of our solar system, their satellites and the sun, dealing with scientific fact and speculation about further explorations. Features paintings of possible planetary landscapes.

PORTRAIT OF THE UNIVERSE—Intro. by Franklyn M. Branley—Astro Mural, 68 p., 32 photographs, \$1.95. Beautiful full-page pictures from Mt. Wilson, Lick and Yerkes observatories.

RADIOLOGICAL HEALTH DATA: Monthly Report—Public Health Service—OTS, 48 p., paper, 50¢; six months subscription, \$3. Contains 1959 data on radiation levels in air, water and milk.

SELECTED SCIENCE BOOKS FOR SECONDARY SCHOOLS: A Bibliography (First Supplement)—R. Vincent Cash and others—CSTA Bibliography Committee, 32 p., paper, 35¢ direct to publisher, Central Connecticut State College, New Britain, Conn. Lists 165 new titles, classified and annotated.

Science News Letter, June 25, 1960

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By O. Levin, M.D., and H. Behrman, M.D.

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ERRATA, Vol. 77, Nos. 1-26, January-June, 1960

PAGE	TITLE BEGINS	CORRECTIONS
40	Age of the	Line 1, 18,000 trillion for 18 billion.
71	Radar Sees	Par. 4, line 2, after director insert of research.
116	New Schools	Col. 2, par. 3, lines 3 and 4, delete an other tie; line 6, after D. C., insert and Lyons Township High School, La Grange, Ill.,
119	Lamb in	Col. 2, line 14, excrements for experiments.
121	Tooth Linked	Line 2, 1955 for 1958. Par. 2, line 3, after 1959 delete remainder of sentence. Par. 3, line 2, 1955 for 1958; line 4, after Near-Men insert comma, instead of that lived even earlier than Zinjanthropus, read although Dr. Leakey believes that Zinjanthropus is quite distinct from the South African members of the group. Par. 4, line 5, and par. 6, line 1, insert other before australopithecines.
122	Heart Disease	Subhead, first sentence to read Two persons die of heart disease every minute in the United States.
203	Celestial Time	Line 17, April 27, Neptune for Uranus.
261	Blood Loss	Par. 3 (p. 262), line 4, before daily, insert four times; line 5, eight for ten.
376	Birth Control	Par. 6, line 3, after reports delete remainder of sentence.

ASTRONOMY

Jupiter and Saturn Prominent

Jupiter is brighter than any star or planet now seen in the sky. The sun is over three million miles farther away from earth in July than it was six months ago.

By JAMES STOKLEY

THIS MONTH, two bright planets are added to the normally prominent stars that shine in the south on July evenings. These planets are Jupiter, largest of the bodies, of which the earth is one, that revolve around the sun; and Saturn, famed for its system of rings. The rings, of course, are only visible with telescopic aid.

Both planets are shown on the accompanying maps, which give the sky's appearance about ten p.m. at the beginning of July—your own kind of standard time (add one hour for daylight saving). By the middle of July the sky will appear like this an hour earlier, and by the end of the month two hours earlier.

Since Jupiter, with magnitude minus 2.1 on the astronomical brightness scale, is more brilliant than any other star or planet now visible, you can locate it easily.

It is in the constellation of Sagittarius, the archer, although it is not far from the boundary between that group and Ophiuchus, the serpent-carrier. Saturn is farther east, i.e., to the left. Its magnitude is 0.3, which is quite bright, although only about a ninth as brilliant as Jupiter.

Below Jupiter is the hook-shaped line of stars that mark the tail of the scorpion, Scorpius. The rest of the constellation ex-

tends westward, toward Libra, the scales. Brightest star in Scorpius is Antares, which is distinctly red in color. Its magnitude is 1.2, which makes it less than half as bright as Saturn.

High overhead you can see the most brilliant star of the summer evening: Vega, in Lyra, the lyre. As shown on the maps, it is a little east of the zenith. With a magnitude rating of 0.14, it is even brighter than Saturn. (The smaller the positive number, the brighter the star; negative numbers indicate even brighter objects, on a scale of increasing brilliance for larger numbers).

Below Vega is the constellation of Cygnus, the swan, with the star called Deneb. A little to the right, toward the south, is another bird, Aquila, the eagle, in which you see Altair.

To the northwest is the great bear Ursa Major, with the smaller group called the big dipper. It hangs downward, now, with Alkaid at the top. Merak and Dubhe, at the bottom, are the well-known pointers. They show the direction, toward the right, of Polaris, the pole star, in Ursa Minor, the little bear. If you follow the curve of the dipper's handle toward the south you come to Arcturus, in Bootes, and farther south, to Spica, in Virgo, the virgin.

Although only Jupiter and Saturn are

shown on our maps, Venus is also in the evening sky, although not easy to see. On June 22 it passed behind the sun, and now it follows that body across the sky. Thus, it remains above the horizon for a short time after sunset, but not long enough to be easily seen. By November, however, it will set about two hours after sunset, and then it will be conspicuous in the western evening sky.

Mercury is not visible at all in July. It comes between the sun and earth—at the position called inferior conjunction—on July 16. Mars is visible in the east, in the constellation of Taurus, the bull, in the early morning. It rises about three hours before the sun.

Despite the fact that we are now entering the time of year when warm weather is expected, the sun is now farthest away from the earth. Men once thought that the planets could only move in circles, but years ago the great German astronomer, Johann Kepler, showed that they move in ellipses, which are elongated circles. The sun is not located in the center of the ellipse, but at a point called the focus, off a little to one side. And as the earth goes around the sun each year, sometimes it is close to this focus, and to the sun. At a times six months later it is as far from the sun as it can be.

Earth Nearest Sun in January

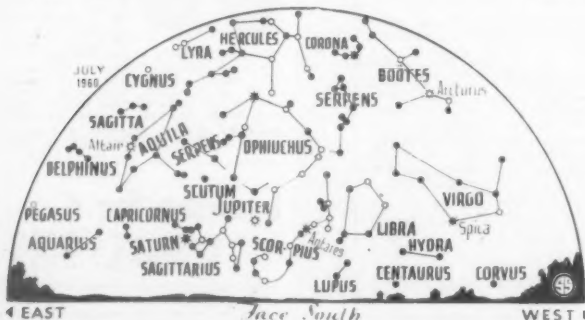
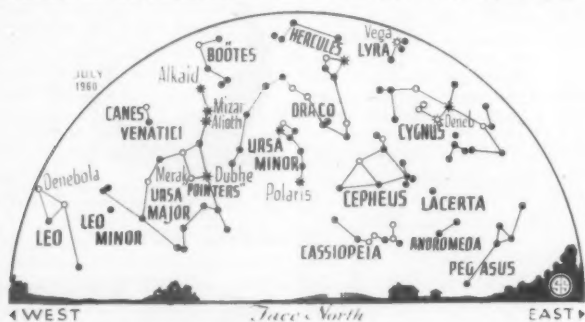
Last Jan. 4 the earth was nearest the sun, which was then 91,342,000 miles away. Ever since that date the distance has been increasing. It reaches its maximum on July 2, with 94,452,000 miles.

Even though the sun is more than three million miles farther away than it was six months ago, we do not have cold weather because its rays are shining more directly on those of us who live in the Northern Hemisphere.

Last January, even at noon, when the sun was at its highest for the day, it was only 27 degrees above the southern horizon—for a place at 40 degrees north latitude, which is typical for the U. S. But in early July, at noon, the sun is 73 degrees above the horizon.

Because it is now so much closer to being overhead, the sun's rays fall more directly upon us. A yard-square beam of solar radiation, with its light and heat, covers only slightly more than a square yard of ground. But last January, when it was so low at noon, this same yard-square beam had to cover more than two square yards, because it came at such a low angle.

And also, in July, the sun is in the sky many more hours than it is in January, when the days are short, and its heating effect continues for a longer proportion of the time. These effects are many times greater than the slight cooling in July produced by the sun's greater distance, which does tend to limit the extremes to which heat and cold can go.



• • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

In the Southern Hemisphere conditions are reversed. For people there the sun is now low at noon; winter has begun. And next December, when the sun again is low for us, it will be high over Argentina and Australia, etc., and summer will start in the Southern Hemisphere.

Earlier in this article the positions of the planets were discussed. There are generally considered to be nine: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. These are the "major" planets; Mercury, the smallest, is about 3,000 miles in diameter. But also there are many thousands of asteroids, tiny planets, of which the largest are only a few hundred miles in diameter; the smallest, only a fraction of a mile.

One of the largest of these is called Vesta. It is about 240 miles in diameter, and even though three others are somewhat larger, it is the brightest of them all. Evidently it reflects light better than they do, for the asteroids, like the major planets, are visible only by the sunlight they reflect.

During July, Vesta makes a close approach to the earth. On July 2 it will be directly opposite the sun, and at a distance of 107,500,000 miles. It will then be in Sagittarius, just a little to the east of Saturn, and of the sixth magnitude, which is usually considered to be the limit of naked-eye visibility. But this means under the very best conditions, and being so low in the sky a telescope will be needed to see Vesta, even on the second. But at least, as you look at Saturn and Jupiter, you can think that there is also a third planet between them.

Celestial Timetable for July 1960

July	EST	
1	10:49 p.m.	Moon in first quarter.
2	9:00 a.m.	Vesta opposite sun and nearest earth, distance 107,500,000 miles.
	5:00 p.m.	Earth nearest sun, distance 94,452,000 miles
7	1:00 a.m.	Saturn opposite sun and nearest earth, distance 839,400,000 miles
	7:00 a.m.	Moon passes Jupiter
8	6:00 a.m.	Moon nearest earth, distance 221,900 miles
	1:00 p.m.	Moon passes Saturn
	2:37 p.m.	Full moon
15	10:43 a.m.	Moon in last quarter
16	8:00 p.m.	Mercury passes between sun and earth
17	Noon	Moon passes Mars
21	9:00 a.m.	Moon farthest, distance 252,500 miles
23	1:31 p.m.	New moon
31	7:39 a.m.	Moon in first quarter
	Subtract one hour for CST, two hours for MST, and three for PST.	

Science News Letter, June 23, 1960

Do You Know

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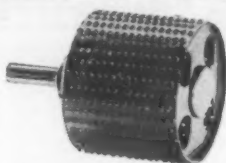
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PSYCHIATRY

Food Aversion Corrected By Combination Therapy

A NEW TREATMENT has been found for anorexia nervosa, a condition in which patients refuse to eat because they believe it is harmful.

Drs. Peter J. Dally and William Sargent of St. Thomas's Hospital in London report that their method has been tried by other hospitals and is more effective than any other treatment used previously.

The suggested procedure is to use large doses of chlorpromazine with modified insulin treatment carried to the point of sweating and drowsiness. The patient is kept in bed until his weight is nearly back to normal, the physicians report in the British Medical Journal, June 11, 1960.

Anorexia nervosa has puzzled physicians and psychiatrists since it was first described in 1874. Although some psychiatrists believe that patients must be slightly schizophrenic, others consider the condition a hysterical manifestation.

Patients are usually emaciated and may have been on a starvation diet of fewer than 1,000 calories per day for many months. Women are afflicted more often than men. Under psychoanalysis some women have indicated that they feared they would become pregnant if they ate.

Science News Letter, June 25, 1960

PHYSICS

Metal Model Shows Fermi Surface

See Front Cover

THE WAYS in which the momentum of a conduction electron varies as it travels through a metal is illustrated by means of a model with 14 concave faces that serve as a physical representation of the hypothetical Fermi surface.

As electrons move through the lattice work of atoms, the momentum of each varies according to the direction they take. The momentum varies from one metal to another depending on the number of atoms per unit volume and the number of conduction electrons per atom. In the model, seen on the cover of this week's Science News Letter, these variations are represented by the varying distances from the center to the surface.

The model was developed by physicist Dr. B. W. Roberts at General Electric Research Laboratory, Schenectady, N. Y.

Science News Letter, June 25, 1960

Questions

ARCHAEOLOGY—Of what materials were the ancient buildings found in Pakistan made? p. 406.

MEDICINE—How soon will a positive reaction show up in a skin-scratch test if a person is allergic to penicillin? p. 403.

Photographs—Cover, General Electric Research Laboratory; p. 403, The Upjohn Company; p. 405, Esso Petroleum Company; p. 406, The American Museum of Natural History; p. 412, The Philip Lesly Co.

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Science News Letter, June 25, 1960

PANTS HANGER, especially useful for drip-dry trousers, holds pants by inside of cuffs. User simply inserts hanger into cuffs and releases hanger's spring. Spring presses grips into cuffs. With this action, the hanger holds pants flat and straight.

Science News Letter, June 25, 1960

VERSATILE TABLE is a rolling tea wagon when fully open. With part of the bottom shelf folded up, the unit forms an individual dining table. When half folded up, it fits against a wall as a book and knick-knack holder. Made of brass-plated frame and black shelves or in black finish throughout, the table folds flat for storage.

Science News Letter, June 25, 1960

SQUARED DOORKNOB, shown in the photograph, is designed to be easy for very young and very old fingers to turn. Cast in bronze, brass, chrome or aluminum, the



knob is constructed for heavy traffic doors such as in schools and institutions, as well as in the home.

Science News Letter, June 25, 1960

SWIVEL BABY SPOON is said to help baby learn to feed himself. The swivel action is designed to keep the spoon's bowl

level, even when the baby twists the spoon's handle about. The leveling action helps baby get the food in his mouth, not down his front. The spoon is stainless steel with a boil-proof plastic handle.

Science News Letter, June 25, 1960

PORCELAIN REPAIR KITS, now available in 80 colors to match most standard plumbing fixtures, repair damaged porcelain. Each kit includes filler material and implements, activating chemicals and synthetic porcelain which is water, acid and heat resistant.

Science News Letter, June 25, 1960

TOY TOASTER comes complete with burned "toast." The artificial toast pops up like the real thing. There are no electrical connections. The toaster is about three inches high.

Science News Letter, June 25, 1960

FM CAR RADIO-CONVERTER may be used as a converter with an already installed AM radio or, with the simple addition of components, the converter makes a complete FM system. Slim, the radio extends just two and a quarter inches below the dashboard.

Science News Letter, June 25, 1960



Nature Ramblings



By HORACE LOFTIN

A SOUTHERN NEWSPAPER recently carried an article about the editor's hearing a whippoorwill in a pine thicket near his home. "A sure sign of summer," he wrote.

Sign of summer? Indeed not, at least not in that region where the whippoorwill is found only in winter and early spring. The editor described the melancholy call of his bird as "chip-married-a-widow."

Putting together the evidence of the late spring date of the bird and its particular song, it is clear that the editor had not heard a whippoorwill, but its southern cousin, chuck-will's-widow!

One must go farther north or west for the typical summer range of the whippoorwill. This bird, smaller than the chuck-will's-widow, can be heard in summer "up North" monotonously calling its three-note song whip-poor-will, whip-poor-will, whip-poor-will—the accent always on the last note.

One record-breaking whippoorwill sang his twilight song at least 1,000 times in

Twilight Birds



succession by actual count, with only about two seconds' interval between songs.

The southern chuck-will's-widow, on the other hand, has a very distinctive four-note song, the accent falling on the wid in "widow." Anyone who has heard both songs will never have trouble in telling the two apart.

These birds belong to a weird-looking tribe of twilight-loving birds called the goatsuckers. Because of their nocturnal ways, their fiery-red eyes when seen in reflected light, and their grotesque appear-

ance, the goatsuckers have won a place in many myths and ghost stories. The name of the group is derived from an ancient belief that these birds, with their great wide mouths, suck milk from goats and other domestic animals.

There are several members of this family in the United States, and even a greater number in the tropics. One well known, wide-ranging species is the nighthawk or bullbat. This hawk-like bird may be seen gliding and diving recklessly through the late afternoon sky over most of the country during summer. Its call is unique, and can only be described as a big, loud peee-un!

The poor-will occurs in the West. Its name implies, its song is a two-note poor-will, or better, poor-jill. This bird usually found in semi-arid country. It has been reported to undergo a type of hibernation in winter much as many mammals do.

The Pauraque, more typical of the American tropics, may be seen along the Gulf coast of Texas and the lower Rio Grande.

Science News Letter, June 25, 1960

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